



UNITED STATES GENERAL ACCOUNTING OFFICE

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MISSION ANALYSIS AND  
SYSTEMS ACQUISITION DIVISION

B-208520

RESTRICTED — Not to be released outside the Accounting Office by the Office of Management and Budget, August 12, 1982

The Honorable Mario Biaggi  
House of Representatives



119256

Dear Mr. Biaggi:

Subject: Procurement, Modification, and Use of  
the OH-58 Helicopter (GAO/MASAD-82-44)

On April 9, 1982, you requested us to assess the Army's benefits in continuing to invest in modernizing the light observation OH-58 helicopter and to determine why the Army purchased the helicopter before testing it to ensure that it met the Army's needs.

Modernizing the OH-58 involves two ongoing efforts. One concerns upgrading the OH-58A to an OH-58C configuration. Basically, this involves installing an upgraded engine and making some minor modifications. The second effort, a conversion to an OH-58D, involves an entire refurbishment of the OH-58A helicopter, except for the airframe, and is identified as the Army Helicopter Improvement Program. The OH-58D is now in full-scale engineering development.

After receiving your request, we informed your office that we had already planned to review the Army Helicopter Improvement Program and report on it to the key congressional committees early next year. We agreed to send you a copy of the report when it is issued. Therefore, this report covers only the modification from the OH-58A to the OH-58C version, in addition to the early history of the OH-58A procurement.

Because of the almost 15 years that have elapsed since the OH-58's initial procurement, only a handful of individuals who were involved in its procurement and testing are still in the service. We interviewed three of them. Also, we interviewed several pilots and other officials at two Army user organizations, as well as officials at Army Headquarters, the Army Aviation Research and Development Command, and the Troop Support and Aviation Materiel Readiness Command, to determine the extent that the OH-58A and OH-58C are used. We also obtained and reviewed test records covering helicopter tests conducted when the OH-58A was first procured.

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Our review was performed in accordance with our "Standards for Audit of Governmental Organizations, Programs, Activities, and Functions."

The upgrading to the OH-58C version has resulted in a helicopter with improvements in flight performance and survivability capabilities accomplished at a relatively modest cost. Up to this point, 275 helicopters have been modified at a reported cost of about \$143,000 per aircraft. The Army is in the process of converting an additional 310 aircraft to the OH-58C version. Despite some continuing flight shortcomings, the OH-58C is being used and currently represents the Army's most advanced scout helicopter.

Concerning the testing of the OH-58A, we examined reports showing that the Army tested the helicopter and concluded that it met its requirements and was capable of performing its assigned mission. However, the tests were not conducted until after the production contract was awarded. Normally, in a major weapon system development such tests are made or begun before production is approved. In this instance, however, the contractor had been producing a commercial model from which the OH-58 was to be derived, and the Army believed it sufficient to limit itself to flight testing the commercial model and to evaluating the contractor's technical proposal for the light observation helicopter. Based on these evaluations and the tests performed after the contract award on an OH-58 production model, the Army determined that the helicopter met its requirements.

#### BACKGROUND

As a result of the Army's need for a light observation helicopter, the Army through competitive bidding procedures awarded to Hughes Tool Company in 1965 a contract for 714 helicopters, designated the OH-6. Additional orders were subsequently given to Hughes for about 700 more of these aircraft. Because of congressional and Army concerns over a significant price increase proposed by Hughes, a follow-on procurement for a light observation helicopter was also opened to competition. Bell Helicopter Company was low bidder and was awarded a contract in 1968 for 2,200 helicopters identified as the OH-58A.

#### MODERNIZING THE OH-58A HELICOPTER

The primary uses of the OH-58 helicopter when it was acquired were for observation, target acquisition, reconnaissance, and command and control missions. Subsequent changes in tactics were introduced due to changes both in the types of threat and in the anticipated environments in which the helicopter was to operate. These created a need for a helicopter with flight performance capabilities that could satisfactorily perform nap-of-the-earth and pop-up maneuvers. This involves flying at low altitudes

following the terrain contours to avoid detection by the enemy and emerging periodically for target sighting and other purposes.

To meet this need, the Army initiated a product improvement program to upgrade the OH-58A helicopter. This effort resulted in converting 275 OH-58A helicopters to the OH-58C configuration. While our assessment of the performance of the two helicopters has shown the OH-58C version to be an improvement over the OH-58A, we could not measure the improved effectiveness in terms of the costs associated with the improvement. However, these costs are modest.

Our interviews with the unit commanders and pilots at Fort Campbell, Kentucky, and Fort Hood, Texas, confirmed that the OH-58C models still have performance limitations when flying missions requiring nap-of-the-earth and pop-up flight maneuvers. These limitations are also acknowledged in several Army assessment reports. However, the OH-58A and OH-58C are considered adequate by the users when not requiring nap-of-the-earth flying and when sufficient airspeed can be maintained. The OH-58A is being generally used for observation and administration support duties. The OH-58C is generally used for more strenuous duties required of a helicopter in attack helicopter or air cavalry units.

The users said that the upgraded engine placed in the OH-58C has improved the hover and rate-of-climb capability and has improved to some degree the ability of the helicopter to perform nap-of-the-earth maneuvers. However, the stability and control problem that exists in the OH-58A is still a major shortcoming of the OH-58C. According to the users, loss of tail rotor authority is a major cause and the pilots have to concern themselves with this flight performance shortcoming when flying the helicopters under high wind conditions and/or high temperature days.

According to the Army, the product improvements to alleviate the pervasive tail rotor problem were not of a high enough priority to require immediate correction in the OH-58A or OH-58C version. Further, the OH-58A and OH-58C are limited in target acquisition and surveillance range. Present technology depends on the human eye aided by binoculars or night vision goggles. The helicopters must pop up to perform their acquisition or surveillance functions. The Army does not consider either of these features adequate in terms of survivability against the mid-1980s or 1990s threat air defense systems. Corrections to eliminate such shortcomings will be included in the Army Helicopter Improvement Program.

We found no reluctance to fly these aircraft provided the pilots do not have to exceed the restrictions stated in the operator's manual. As with all aircraft, the weather conditions, aircraft weight, and operating altitudes have to be considered when determining how the helicopter should be flown. Flight performance capabilities of both the OH-58A and OH-58C decrease as the

temperature, operating altitudes, wind conditions, and helicopter payload increase.

#### OH-58 TESTING

The Army completed two major tests on the OH-58A helicopter. Testing completed in early 1970 covered (1) performance and (2) stability and control requirements. These tests were performed by the Army's Aviation Systems Test Activity now known as the Army Aviation Engineering Flight Activity.

The performance test was conducted over a 5-month period involving 99 flights, and the stability and control test was conducted over a 4-month period and covered 89 flights. The tests confirmed that the Army's requirements were met. We were advised by the Director of Development and Qualification, Army Aviation Research and Development Command that the OH-58A met the Army's requirements for which it was designed and was capable of performing its intended mission at the time it was acquired.

In summary, there is nothing to indicate that the OH-58A did not measure up to the Army's requirements as they stood in the late 1960s and early 1970s when the helicopter was procured. Since then the mission required for the scout helicopter has been broadened and the tactics it is to employ have changed and are more difficult to execute. Converting to an OH-58C provides more capability but still not enough to permit its satisfying the performance needed for flying nap-of-the-earth and popping up to identify targets.

According to the Army, the Army Helicopter Improvement Program will provide it a helicopter capable of meeting the requirements of the expanded scout mission. In reviewing this program, we intend to evaluate the cost this effort will require as well as the helicopter's expected combat use.

While we did not submit a draft of this letter to the Department of Defense for comments, we have discussed its contents with Army officials closely associated with the OH-58 program. Their comments are included in the report where appropriate.

As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 10 days from the date of the report. At that time we will send copies to interested parties and make copies available to others upon request.

B-208520

We hope this information will be useful to you. We are available to discuss it further with you or your staff.

Sincerely yours,

A handwritten signature in cursive script, appearing to read "W. H. Sheley, Jr.", written in dark ink.

W. H. Sheley, Jr.  
Director